

Testing for macromolecules essay sample

[Science](#), [Chemistry](#)



By observing the table above, we could see that Benedict's test was for reducing sugars, iodine test was for the presence of starch, filter paper was for the presence of fatty acids, and the Biuret test was for amino groups present in proteins. Benedict's solution was used to test for the presence of simple sugars, such as glucose (monosaccharide). When heated, the solution mixed with monosaccharides produced a reddish-orange colour. This was because Benedict's solution is composed of sodium citrate, sodium carbonate, and cupric sulfate pentahydrate. When solution is heated, an oxidation-reduction reaction occurs: cupric ion (Cu^{+2}) oxidizes into a cuprous ion (Cu^{+}) and precipitates into cuprous oxide (Cu_2O) because Benedict's solution loses an oxygen ($\text{Cu}^{+2} \rightarrow \text{Cu}^{+}$ forming Cu_2O). Basically, it is a reaction between the aldehyde group ($-\text{CHO}$) of the glucose molecule and Benedict's solution.

The reason why sucrose did not react to Benedict's solution was that sucrose is a disaccharide. If disaccharides are not broken down into monosaccharides then there will be no colour change. Iodine solution was used to determine the presence of starch from simple sugars (monosaccharides, disaccharides, and polysaccharides). Starch reacted with iodine to produce a bluish-black colour because of the unstable union between the starch molecules and iodine solution. Filter paper was used to determine the presence of lipids. Unlike other samples, vegetable oil remained on the paper after a period of time. This was probably because lipids are non-polar, therefore could not evaporate at room temperature. Biuret reagent (alkaline copper solution) was used to test the presence of proteins. If a solution is tested positive for protein, the solution will turn purple. This is due to the reaction between

Biuret reagent and the peptide bonds in the proteins. Throughout the lab, a control (distilled water) was used to ensure that we would not mistaken the indicators dissolved in the samples as chemical changes; therefore the outcomes would be accurate.

An example of an application of this lab in real life would be a physician testing for levels of glucose and lipid in the blood or urine of a patient. Knowing the level of glucose and lipid in one's body is extremely important because high amounts of glucose and lipid can indicate a risk of developing diabetes or heart-related conditions, such as coronary artery disease. Also, high levels of proteins in urine can indicate that one may be pregnant (very active women typically have more proteins in their urine), experiencing kidney failure, use of anabolic steroids, androgens, and other hormones. Although the indicators we used in this lab does not provide specific results, it does allow a person (e. g. doctor, students) to gain a basic idea about the situation (patient's status, composition of a substance).